

## The Net Benefits of Improved Testing for Pathogen Contamination at Swimming Beaches

Julie Hewitt

Economist

U.S. EPA Office of Policy, Economics, and Innovation (OPEI)/ National Center for Environmental Economics (NCEE)

(202) 566-2290

[hewitt.julie@epa.gov](mailto:hewitt.julie@epa.gov)

**Authors:** Julie Hewitt<sup>1</sup>, Matthew Clark<sup>2</sup>, William Wheeler<sup>2</sup>, Ritu Tuteja<sup>2</sup>, Elizabeth Sams<sup>3</sup>, Tim Wade<sup>3</sup>, Kristen Brenner<sup>4</sup>, Al Dufour<sup>4</sup>

<sup>1</sup>U.S. EPA OPEI/NCEE

<sup>2</sup>U.S. EPA Office of Research and Development (ORD)/ National Center for Environmental Research (NCER)

<sup>3</sup>U.S. EPA ORD/ National Health and Environmental Effects Research Laboratory (NHEERL)

<sup>4</sup>U.S. EPA ORD/ National Exposure Research Laboratory (NERL)

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Wet weather and sewer overflows sometimes lead to poor microbial water quality at beaches that increases the risk of swimmers getting sick. In response, many states close or post warnings at beaches when water quality tests show unacceptable levels. Water quality monitoring methods currently in use require up to 24 hours for results to become available. During the time between testing, obtaining results, and beach closure or posting, swimmers may be at risk of becoming ill due to exposure to unacceptable water quality.

Scientists in ORD have recently developed a new Quantitative Polymerase Chain Reaction (QPCR) method for measuring water quality at beaches. The U.S. Environmental Protection Agency's (U.S. EPA) new method requires about two hours to obtain results and has a relatively low rate of false positives. The benefits of the new method are threefold: first, more rapid turnaround time for test results would allow beach managers to take action earlier during a contamination event, reducing potential exposure to pathogens; second, subsequent tests would allow beaches to re-open sooner after water quality returns to acceptable levels, increasing the time the beach is available for recreation; and third, more accurate tests with fewer false positives would avoid some unnecessary beach closures and their economic impacts.

A team of economists and public health experts from ORD and OPEI will estimate the benefits produced by the improved testing methodology, using data from: a) the U.S. EPA's Beach Survey that provides details on beach events (beaches, frequency and duration of closures and advisories, and monitoring data), b) the U.S. EPA's National Epidemiological and Environmental Assessment of Recreational (NEEAR) Water Study that provides information on exposure-response functions relating levels of fecal indicator bacteria to risk of gastrointestinal illness, c) information on the value of reduced risk of illness from exposure, and d) the value of a day of swimming recreation.

The new test procedure will require investment in local testing equipment, supplies and facilities.

The distance between these facilities and beaches will also factor into the number of beaches that actually adopt this new test methodology. Subtracting the additional testing costs from the benefits leads to the net benefits associated with the new test and allow us to demonstrate returns associated with the development of this new test.

This poster will demonstrate preliminary results of our study, focusing on beaches on the Great Lakes.